



GRADE 12TH MATHS
CHAPTER 2

Inverse Trigonometry Functions

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OBJECTIVE TYPE QUESTIONS (1 MARK)

1. Which of the following corresponds to the principal value branch of $\tan^{-1}x$?

- (a) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ (b) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (c) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right) - \{0\}$ (d) $(0, \pi)$

2. Which of the following is the principal value branch of $\cos^{-1}x$?

- (a) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (b) $(0, \pi) - \left\{\frac{\pi}{2}\right\}$ (c) $(0, \pi)$ (d) $[0, \pi]$

3. Which of the following is the principal value branch of $\operatorname{cosec}^{-1}x$?

- (a) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$ (b) $[0, \pi] - \left\{\frac{\pi}{2}\right\}$ (c) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (d) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

4. The principal value branch of $\sec^{-1}x$ is

- (a) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$ (b) $[0, \pi] - \left\{\frac{\pi}{2}\right\}$ (c) $(0, \pi)$ (d) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

5. One branch of \cos^{-1} other than the principal value branch corresponds to

- (a) $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$ (b) $[\pi, 2\pi] - \left\{\frac{3\pi}{2}\right\}$ (c) $(0, \pi)$ (d) $[2\pi, 3\pi]$

6. The value of $\sin^{-1}\left(\cos\left(\frac{43\pi}{5}\right)\right)$

- (a) $\frac{3\pi}{5}$ (b) $-\frac{7\pi}{5}$ (c) $\frac{\pi}{10}$ (d) $-\frac{\pi}{10}$

7. The principal value of the expression $\cos^{-1}[\cos(-680^\circ)]$ is

- (a) $\frac{2\pi}{9}$ (b) $-\frac{2\pi}{9}$ (c) $\frac{34\pi}{9}$ (d) $\frac{\pi}{9}$

8. The value of $\cot(\sin^{-1}x)$ is

- (a) $\frac{\sqrt{1+x^2}}{x}$ (b) $\frac{x}{\sqrt{1+x^2}}$ (c) $\frac{1}{x}$ (d) $\frac{\sqrt{1-x^2}}{x}$

9. If $\tan^{-1}x = \frac{\pi}{10}$ for some $x \in \mathbb{R}$, then the value of $\cot^{-1}x$ is

- (a) $\frac{\pi}{5}$ (b) $\frac{2\pi}{5}$ (c) $\frac{3\pi}{5}$ (d) $\frac{4\pi}{5}$

10. The domain of $\sin^{-1} 2x$ is

- (a) $[0, 1]$ (b) $[-1, 1]$ (c) $\left[-\frac{1}{2}, \frac{1}{2}\right]$ (d) $[-2, 2]$

11. The principal value of $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ is

- (a) $-\frac{2\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) $-\frac{4\pi}{3}$ (d) $\frac{5\pi}{3}$

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12. If $3\tan^{-1} x + \cot^{-1} x = \pi$, then x equals
 (a) 0 (b) 1 (c) -1 (d) $\frac{1}{2}$
13. The domain of the function $\cos^{-1}(2x - 1)$ is
 (a) $[0, 1]$ (b) $[-1, 1]$ (c) $(-1, 1)$ (d) $[0, \pi]$
14. The domain of the function defined by $f(x) = \sin^{-1} \sqrt{x-1}$ is
 (a) $[1, 2]$ (b) $[-1, 1]$ (c) $[0, 1]$ (d) none of these
15. If $\cos\left(\sin^{-1} \frac{2}{5} + \cos^{-1} x\right) = 0$, then x is equal to
 (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) 0 (d) 1
16. The value of $\sin(2 \tan^{-1}(0.75))$ is equal to
 (a) 0.75 (b) 1.5 (c) 0.96 (d) $\sin 1.5$
17. The value of $\sin^{-1}\left(\cos\left(\frac{33\pi}{5}\right)\right)$ is
 (a) $\frac{3\pi}{5}$ (b) $\frac{-7\pi}{5}$ (c) $\frac{\pi}{10}$ (d) $\frac{-\pi}{10}$
18. The value of $\cos^{-1}\left(\cos\frac{3\pi}{2}\right)$ is
 (a) $\frac{\pi}{2}$ (b) $\frac{3\pi}{2}$ (c) $\frac{5\pi}{2}$ (d) $\frac{7\pi}{2}$
19. The value of the expression $2 \sec^{-1} 2 + \sin^{-1} \frac{1}{2}$ is
 (a) $\frac{\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{7\pi}{6}$ (d) 1
20. If $\tan^{-1} x + \tan^{-1} y = \frac{4\pi}{5}$, then $\cot^{-1} x + \cot^{-1} y$ equals
 (a) $\frac{\pi}{5}$ (b) $\frac{2\pi}{5}$ (c) $\frac{3\pi}{5}$ (d) π
21. If $\sin^{-1}\left(\frac{2a}{1+a^2}\right) + \cos^{-1}\left(\frac{1-a^2}{1+a^2}\right) = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$, where $a, x \in]0, 1$, then the value of x is
 (a) 0 (b) $\frac{a}{2}$ (c) a (d) $\frac{2a}{1-a^2}$
22. The greatest and least values of $(\sin^{-1}x)^2 + (\cos^{-1}x)^2$ are respectively
 (a) $\frac{5\pi^2}{4}$ and $\frac{\pi^2}{8}$ (b) $\frac{\pi}{2}$ and $\frac{-\pi}{2}$ (c) $\frac{\pi^2}{4}$ and $\frac{-\pi^2}{4}$ (d) $\frac{\pi^2}{4}$ and 0

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23. Let $\theta = \sin^{-1}(\sin(-60^\circ))$, then value of θ is
 (a) $\frac{\pi}{3}$ (b) $\frac{\pi}{2}$ (c) $\frac{2\pi}{3}$ (d) $\frac{-2\pi}{3}$
24. The domain of the function $y = \sin^{-1}(-x^2)$ is
 (a) $[0, 1]$ (b) $(0, 1)$ (c) $[-1, 1]$ (d) \emptyset
25. The domain of $y = \cos^{-1}(x^2 - 4)$ is
 (a) $[3, 5]$ (b) $[0, \pi]$ (c) $[-\sqrt{5}, -\sqrt{3}] \cap [-\sqrt{5}, \sqrt{3}]$ (d) $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$
26. The domain of the function defined by $f(x) = \sin^{-1}x + \cos x$ is
 (a) $[-1, 1]$ (b) $[-1, \pi + 1]$ (c) $(-\infty, \infty)$ (d) \emptyset
27. The value of $\sin(2 \sin^{-1}(0.6))$ is
 (a) 0.48 (b) 0.96 (c) 1.2 (d) $\sin 1.2$
28. If $\sin^{-1}x + \sin^{-1}y = \frac{\pi}{2}$, then value of $\cos^{-1}x + \cos^{-1}y$ is
 (a) $\frac{\pi}{2}$ (b) π (c) 0 (d) $\frac{2\pi}{3}$
29. The value of $\tan(\cos^{-1}\frac{3}{5} + \tan^{-1}\frac{1}{4})$ is
 (a) $\frac{19}{8}$ (b) $\frac{8}{19}$ (c) $\frac{19}{12}$ (d) $\frac{3}{4}$
30. The value of the expression $\sin[\cot^{-1}(\cos(\tan^{-1}1))]$ is
 (a) 0 (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{\frac{2}{3}}$
31. The equation $\tan^{-1}x - \cot^{-1}x = \tan^{-1}\frac{1}{\sqrt{3}}$ has
 (a) no solution (b) unique solution (c) infinite number of solutions (d) two solutions
32. If $\alpha \leq 2 \sin^{-1}x + \cos^{-1}x \leq \beta$, then
 (a) $\alpha = \frac{-\pi}{2}, \beta = \frac{\pi}{2}$ (b) $\alpha = 0, \beta = \pi$ (c) $\alpha = \frac{-\pi}{2}, \beta = \frac{3\pi}{2}$ (d) $\alpha = 0, \beta = 2\pi$
33. If $\cos^{-1}\alpha + \cos^{-1}\beta + \cos^{-1}\gamma = 3\pi$, then $\alpha(\beta + \gamma) + \beta(\gamma + \alpha) + \gamma(\alpha + \beta)$ equals
 (a) 0 (b) 1 (c) 6 (d) 12
34. The value of $\tan^2(\sec^{-1}2) + \cot^2(\operatorname{cosec}^{-1}3)$ is
 (a) 5 (b) 11 (c) 13 (d) 15
35. The number of real solutions of the equation $\sqrt{1 + \cos 2x} = \sqrt{2} \cos^{-1}(\cos x)$ in $[\frac{\pi}{2}, \pi]$ is
 (a) 0 (b) 1 (c) 2 (d) Infinite
36. The principal value of $\cos^{-1}x$, for $x = \frac{\sqrt{3}}{2}$ is _____
37. The value of $\tan^{-1} \sin \frac{-\pi}{2}$ is _____

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38. The value of $\cos^{-1} \cos \frac{13\pi}{6}$ is _____
39. The value of $\tan^{-1} \tan \frac{9\pi}{8}$ is _____
40. The value of $\tan (\tan^{-1}(-4))$ is _____
41. The value of $\tan^{-1} \sqrt{3} - \sec^{-1}(-2)$ is _____
42. The value of $\sin^{-1} (\cos (\sin^{-1} \frac{\sqrt{3}}{2}))$ is _____
43. The value of $\sec \left(\tan^{-1} \frac{y}{2} \right)$ is _____
44. The value of $\sin 2 \cot^{-1} \frac{-5}{12}$ is _____
45. The principal value of $\cos^{-1} \left(-\frac{1}{2} \right)$ is _____.
46. The value of $\sin^{-1} \left(\sin \frac{3\pi}{5} \right)$ is _____.
47. If $\cos (\tan^{-1} x + \cot^{-1} \sqrt{3}) = 0$, then value of x is _____.
48. The set of values of $\sec^{-1} \left(\frac{1}{2} \right)$ is _____.
49. The principal value of $\tan^{-1} \sqrt{3}$ is _____.
50. The value of $\cos^{-1} \left(\cos \frac{14\pi}{3} \right)$ is _____.
51. The value of $\cos (\sin^{-1} x + \cos^{-1} x)$, $|x| \leq 1$ is _____.
52. The value of expression $\tan \left(\frac{\sin^{-1} x + \cos^{-1} x}{2} \right)$, when $x = \frac{\sqrt{3}}{2}$ is _____.
53. If $y = 2 \tan^{-1} x + \sin^{-1} \left(\frac{2x}{1+x^2} \right)$ for all x, then _____ < y < _____.
54. The result $\tan^{-1} x - \tan^{-1} y = \tan^{-1} \frac{x-y}{1+xy}$ is true when value of xy is _____
55. The value of $\cot^{-1}(-x)$ for all $x \in \mathbb{R}$ in terms of $\cot^{-1} x$ is _____.
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